भारतीय प्रबंध संस्थान कोषिक्कोड

Indian Institute of Management Kozhikode

Globalizing Indian Thought

FDP

Advanced Data Analytics for Research and Teaching: Harnessing the Power of R, Python, and Tableau

The IIM Kozhikode Advantage

From the Director's Desk…

IIM Kozhikode programmes designed by world-class faculty with their cutting-edge thought leadership and industry-leading insights empower participants to manage and lead complex leadership challenges with confidence and informed decision-making ability. Our growing global footprints acknowledged and accredited by leading institutions of the world are a testimony to growth we have achieved in our 27-year journey of academic excellence.

At this juncture, it is also pertinent to share that both future and past are integral to the path taken by an institution on this journey of excellence. Having a wide, far-seeing vision is not an indulgence but an activity that is necessary to give meaning to our present, to give this Institution a sense of purpose, direction and imagination. That is why we have chosen to think in terms of what IIM Kozhikode will be able to contribute to India and the world some three decades from now with 'Vision 2047: Globalizing Indian Thought'. The sheer scale, scope and potential impact that India will have on 21st century business makes us believe that this is a legitimate aspiration.

We at IIMK have taken a major initiative for strengthening the country's intellectual infrastructure for management education and training, through the Faculty Development Programmes (FDP). The Faculty Development Programmes at IIMK focuses on:

- Enhancing functional area expertise
- Improving one's classroom delivery both as a teacher and trainer
- Enhancing abilities for conducting meaningful research.

We strongly believe that the IIMK FDP programmes' focus on academic research and teaching pedagogy will greatly benefit the academic community in the country. Wishing you all the very best!

Debashis Chatterjee

Prof. Debashis Chatterjee
Director IIM Kozhikode

Overview

The program “Advanced Data Analytics for Research and Teaching" offered by the Indian Institute of Management Kozhikode is designed to empower educators and researchers with the knowledge and skills needed to excel in the dynamic world of data analytics. In an era where data-driven decision-making is paramount, this program equips participants with the tools and expertise necessary to harness the full potential of R, Python, and Tableau in both research and teaching endeavours.

Program Highlights:

- Comprehensive Data Analytics Training: Dive deep into the world of data analytics with a curriculum that covers a wide range of topics, including data preprocessing, statistical analysis, machine learning, data visualization, and more.
- Hands-On Learning: Learn by doing practical, hands-on exercises and projects that allow you to apply your knowledge to real-world scenarios. Gain valuable experience in data analysis, modelling, and visualization.
- Hands-On Learning: Learn by doing practical, hands-on exercises and projects that allow you to apply your knowledge to real-world scenarios. Gain valuable experience in data analysis, modelling, and visualization.
- Innovative Teaching Methods: Transform your teaching approach by integrating data analytics into your courses. Discover innovative pedagogical strategies that engage students, promote critical thinking, and prepare them for data-centric
- Customization: Tailor your learning experience to your specific interests and goals. Choose from a variety of specialized modules and electives, allowing you to focus on areas such as predictive modelling, data visualization, or domain-spe-
- Expert Instruction: Benefit from the expertise of experienced instructors who are both industry professionals and seasoned educators. Receive personalized guidance and support throughout the program.
- Networking Opportunities: Connect with a diverse community of educators, researchers, and data professionals. Collaborate on projects, share insights, and build a valuable professional network.

Pedagogy

This program is designed to provide an immersive and hands-on learning experience. We believe that the best way to master data analytics is through active engagement and practical application. As such, our pedagogical approach emphasizes the following components:

- Concept Delivery: Our expert instructors will guide the participants through comprehensive concept delivery, ensuring that the participants have a solid foundation in data analytics principles, techniques, and best practices.

- Live Interactive Software Practice Sessions: The participants can implement theory with live interactive software practice sessions. Work directly with R, Python, and Tableau to apply what they have learned, ask questions, and receive immediate feedback.

- Data-Driven Case Studies: Explore real-world data-driven case studies that challenge them to analyze and solve complex problems. These case studies provide a practical context for applying data analytics concepts.

- Real-Life Datasets: Work with authentic, industry-relevant datasets that mirror the challenges and opportunities the participants encounter in their research and teaching endeavours. Gain experience in data collection, pre-

- Capstone Projects: Apply knowledge and skills to a capstone project that reflects the participants' unique interests and goals. This project allows them to demonstrate their mastery of data analytics in a real-world context,

- Collaboration and Peer Learning: Engage with fellow participants, share insights, and collaborate on projects. Peer learning and collaboration foster a supportive and dynamic learning environment.

- Practical Skills Development: Our program prioritizes the development of practical skills, ensuring that the participants are knowledgeable and proficient in using data analytics tools effectively

Combining these pedagogical elements creates an interactive and immersive learning experience that prepares the participants to excel in research and teaching confidently.

Course Details

Module 1: Data and visualising using Tableau
- Types of data and descriptive statistics
- Tableau environment and its understanding
- Basic data visualisation using graphical techniques
- Advanced tableau implementation and dashboard creation
- Other functionalities in Tableau for advanced visualisation

Module 2: Implementing Python for data analysis
- Understanding Python environment (Jupytor Notebook and Google Collaboratory).
- Basic data handling and manipulation
- Advanced functions in Python
- Data visualisation using Python

Module 3: Understanding R for data analytics
- R studio and its environment understanding
- R for basic data handling
- Advanced data exploration and data handling
- Implementing R for advanced data manipulation

Module 4: Understanding statistics and its implementation
- Introduction to statistics and its fundamentals using R and Python
- Inferential statistics: conceptual understanding
- Test of hypotheses (t-test, ANOVA, chi-square, etc).
- MANOVA and MANCOVA

Module 5: Structural Equation Modelling (SEM) Using R
- Data exploration for SEM
- Data cleaning and other treatments
- Exploratory factor analysis and confirmatory factor analysis
- Building SEM and assessing the model fit

Module 6: Implementing unsupervised learning algorithms
- Cluster analysis and its applications
- PCA for data reduction
- Association rule mining and recommendations system: application
- RFM analysis

Module 7: Implementing supervised learning algorithms for regression
- Linear regression (simple and multiple) for estimation prediction
- Checking various assumptions of regression
- Implementing algorithms such as decision trees, random forests, and SVM boosting for regression problems.

Course Details

Module 8: Implementing classification algorithms
- Logistic regression for classification (binomial and multinomial)
- KNN for classification
- Ensemble models: Decision tree, random forest and boosting

Module 9: Applying time series modelling
- Applying univariate and multivariate time series forecasting
- ARIMA, SARIMA, SARIMAX
- Structural time series modelling
- Facebook Prophet and ensemble models.

Module 10: Text mining and unstructured data analysis
- Understanding basics to advanced text mining applications
- Text mining for supervised learning and its applications
- Text mining for un-supervised learning and its applications

Registration Options:

The program is structured into 10 comprehensive modules, each designed to equip the participants with essential skills and knowledge in data analytics using R, Python, and Tableau. We understand that the participants' learning needs may vary, so we offer flexible registration options to suit their preferences:

Option 1: Selective Module Registration:

Choose any two modules as a combo that aligns with your specific interests and objectives.
Pay a registration fee of INR 13,000 + GST (18%) per selected combo.
INR 6,500 + GST (18%) for each additional module.
Complete the modules in sequence to build a customized learning path.

Option 2: Full Program Registration:

Register for the entire program, including all ten modules.
Enjoy a bundled registration package at the cost of INR 50,000 + GST (18%).
Benefit from a comprehensive and cohesive learning experience covering all data analytics aspects.

Upon successful completion of each module and meeting the attendance requirement, participants will receive a module-specific certification. A comprehensive program certification will be awarded to those who register for the full program, complete all modules and fullfil the attendance requirement .

Programme Start Date: 30th July, 2025 **Programme End Date: 31st May, 2026**

Who Should Attend:

This program suits faculty members, researchers, practitioners and educators across all disciplines eager to enhance their data analytics competencies. Whether they are just beginning their journey in data analytics or seeking to deepen their expertise, our program accommodates learners at various skill levels.

Program Duration:

The program spans 120 hours (~10 months) of intensive learning, delivered through live online classes via the Zoom platform. Participants can expect engaging sessions, with classes conducted every week for 3 hours.

This comprehensive program structure ensures ample time to absorb the material, practice hands-on skills, and engage in meaningful discussions with instructors and fellow participants.

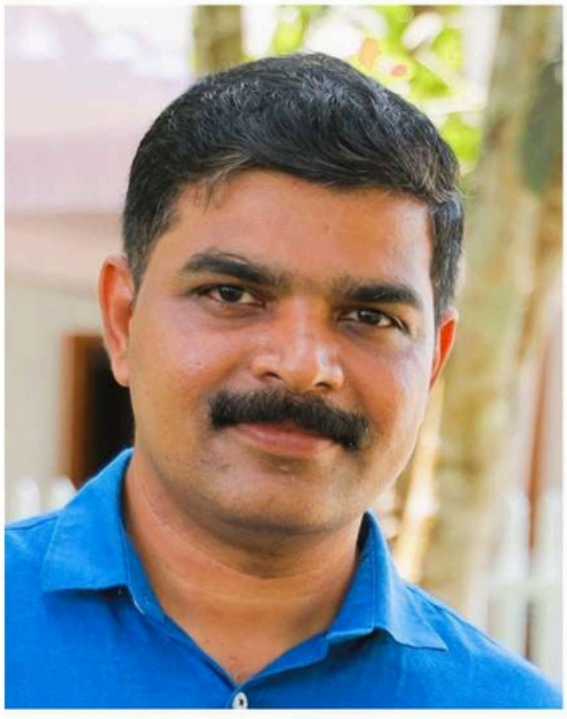
The weekly 3-hour sessions will be conducted on Wednesday/Friday (6.45 PM to 9.45

Certification:

Upon completing the 120-hour program, participants will be eligible to receive a prestigious certification, recognizing their expertise in advanced data analytics for research and teaching.

Programme Directors Profile

Prof. Anandakuttan B. Unnithan.
PhD Professor, Marketing Management Mentor Professor (Academic & Development) Prof. Anandakuttan B. Unnithan obtained his PhD in Marketing from Cochin University of Science and Technology. As an educator, hiswork has spanned consumer behaviour, services marketing, and advertising in his two decades. His publications have appeared in leading marketing journals. He has consulted with major corporations and government agencies and is actively engaged in executive education programmes.



Prof. Sreejesh S. is an Associate Professor of Marketing at the Indian Institute of Management Kozhikode, India. His research is published in prominent outlets such as Industrial Marketing Management, European Journal of Marketing, Journal of Business Research, Journal of Advertising Research, Computers in Human Behaviour, Journal of Brand Management, Journal of Product and Brand Management, Journal of Service Theory and Practice, and many others. He serves on the editorial board of the International Journal of Consumer Studies and has authored books with Pearson and Springer International. He is involved in several executive training programs for various companies, and coordinates and delivers lectures for short and long-duration executive certificate programs at IIM Kozhikode.